

L 61071-65

ACCESSION NR: AP5018269

during compacting and the tensile strength as a function of the purity of the initial powders; and 4) the elongation of sintered Nb moldings as a function of the purity of the initial powders. Orig. art. has: 5 figures and 1 table.

ASSOCIATION: Moskovsky elektrolampovyy zavod (Moscow Electric Bulb Factory)

SUBMITTED: 15Jun64

ENCL: 00

SUB CODE: MM

NO REF SOV: 005

OTHER: 001

Card 2/2

IRISOVA, N.A.; DIANOV, Ye.M.

Ultrahigh frequency absorption of CH_3GeF_3 . Opt. i spektr. 9 no.2:
261 Ag '60. (MIRA 13:8)
(Germanium compounds--Spectra)

L 2994-66

ACCESSION NR: AP5021348

UR/0120/65/000/004/0140/0143

535.853.3-14

30
8

AUTHORS: Dianov, Ye. M.; Irisova, N. A.; Prokhorov, A. M.

TITLE: An arrangement for measuring the coefficients of reflection and transparency of substances operating in monochromatic radiation in the millimeter and submillimeter range

SOURCE: Priory i tekhnika eksperimenta, no. 4, 1965, 140-143

TOPIC TAGS: short wave radiation, reflected radiation, transmission, glass, plexiglass, polystyrene/K8 glass

ABSTRACT: The authors describe a setup for producing monochromatic radiation in the range of 1—4 mm, designed for measuring the coefficients of reflection and transparency. An electron tube operating in the desired range transmits its radiation along a metallic waveguide to a multiplier head of semiconducting material. The mouth of this device is at the focus of a spherical mirror. The radiation is then directed to a diffraction grating. Depending on the purpose of the experiment, the radiation may then be reflected from another spherical mirror into various optical systems. The principal design of the setup is illustrated in Fig. 1

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L 2994-66

ACCESSION NR: AP5021348

of the Enclosure. The setup makes possible the production of radiation in either converging or parallel beams, and the use of dielectric waveguides permits the radiation to be transmitted to distances of several meters from the device. Preliminary measurements were made on the transparency and reflection of several substances. Coefficients of absorption were found to be $6.8 \cdot 10^{-3}$ and $3.0 \cdot 10^{-2}$ for plexiglass and K-8 glass, respectively, for a wavelength of 2 mm. "The authors thank Ye. N. Bol'shakov for his aid in building the device, Ye. A. Vinogradov for useful discussions, and L. K. Kiselev for participating in the work of setting up the equipment and for adjusting the radio engineering apparatus." Orig. art. has: 3 figures and 1 formula. [04]

ASSOCIATION: Fizicheskii institut AN SSSR, Moscow (Physical Institute, AN SSSR)

SUBMITTED: 08Jun64

ENCL: 01

SUB CODE: OP, EC

NO REF SOV: 006

OTHER: 002

ATD PRESS: 4109

Card 2/3

L 2994-66

ACCESSION NR: AP5021348

ENCLOSURE: 01 0

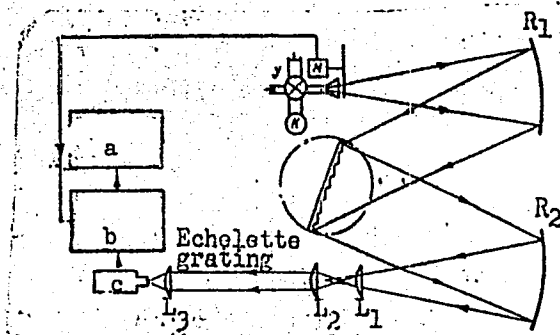


Fig. 1. Setup for measuring reflection and transparency

a - EPP-09 Automatic recorder; b - amplifier and synchronous detector; c - optical acoustical receiver; K - electron tube; Y - multiplier; M - modulator; R₁ and R₂ - spherical mirrors ($\phi = 280$ mm, $F = 750$ mm); L₁, L₂, L₃ - short-focus polystyrene lenses ($\phi = 74$ mm, $F = 60$ mm).

Card 3/3 *md*

L 2688-66 EWT(1)/EWA(h)
ACCESSION NR: AP5021349

UR/0120/65/000/004/0144/0145
621.372.8:621.315.61

AUTHOR: Dianov, Ye. M.; Irisova, N. A.; Karlov, N. V.

TITLE: Use of dielectric waveguides in millimeter-band spectroscopy

SOURCE: ²⁵Pribory i tekhnika eksperimenta, no. 4, 1965, 144-145

TOPIC TAGS: waveguide, dielectric waveguide, circular waveguide, microwave spectroscopy

ABSTRACT: Waveguides made from solid, homogeneous, flexible polyethylene rods of circular cross section were used to excite EPR resonators submerged in liquid helium and to conduct energy to receiving elements based on semiconductor photoconductivity at liquid helium temperatures. The real and imaginary parts of the polyethylene refractive index were $n = 1.51$ and $k \approx 3 \cdot 10^{-4}$ (at $\lambda = 2$ mm). Use of the waveguide made it possible to conduct tests with a single well-aligned, rigidly fixed emission source in several experimental arrangements. The focal spot (~ 4 mm) of the quasi-optical system excited a conical horn whose inlet aperture somewhat

Card 1/2

L 2688-C6

ACCESSION NR: AP5021349

exceeded the focal spot diameter. Waveguide losses were negligible. The liquid helium proved less volatile than when metal waveguides are used. Orig. art. has: 1 figure. [TS]

ASSOCIATION: Fizicheskii institut AN SSSR, Moscow (Physics Institute, AN SSSR)

SUBMITTED: 22Jun64

ENCL: 00

SUB CODE: EC

NO REF SOV: 000

OTHER: 002

ATD PRESS: 4/02

Card

2/2

ACC NR: AP5027994

SOURCE CODE: UR/0386/65/002/007/0323/0326

AUTHOR: Vinogradov, Ye. A.; Dianov, Ye. M.; Irisova, N. A.

ORG: Physics Institute im. P. I. Lebedev, Academy of Sciences, SSSR (Fizicheskii institut Akademii nauk SSSR)

TITLE: Fabry-Perot interferometer for the short millimeter and submillimeter bands with metallic grids having periods smaller than the wavelength

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. (Prilozheniye), v. 2, no. 7, 1965, 323-326

TOPIC TAGS: interferometer, millimeter wave, submillimeter wave, microwave component, diffraction grating

ABSTRACT: The authors report the development of elements which have a periodic structure with a period smaller than the wavelength for use as mirrors in a Fabry-Perot interferometer (Fig. 1). These grids were made of parallel metal wires stretched over metal rings. One grid of the interferometer was rigidly secured, and the other could be moved slowly, with the aid of a special precision mechanism, so that both grids remained parallel to each other. The interferometer could operate both in reflection and transmission regimes. Such an interferometer has an unusually large bandwidth. Thus, a single model could be used for measurements in the entire range from 4 to 0.5 mm. The grids used had apertures (a) 100 and 50 mm, wire spacing (1) from 50 to 150 μ and wire thickness (2r) from 15 to 8 μ . When operating with tungsten grids, a Q-factor of approxi-

Card 1/3

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I. 6491-66

ACC NR: AP5027994

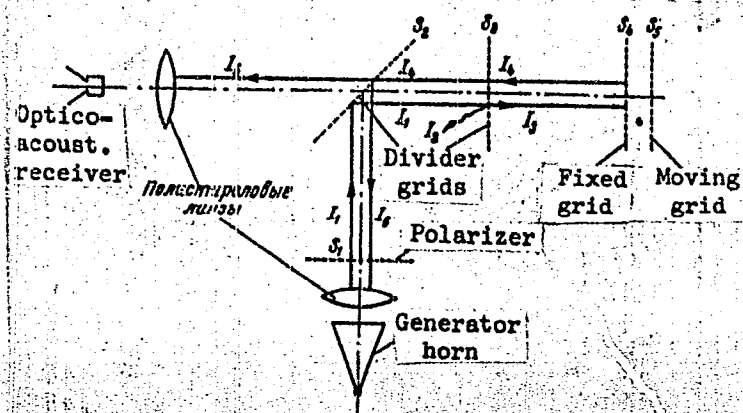


Fig. 1. Diagram of Fabry-Perot interferometer operating with reflected signal

S_1 - Grids with parallel wires; I_1 - radiation intensity in the beams (relative intensity distribution in the absence of resonance is $I_1 = 1, I_2 = I_3 = I_4 = 1/2, I_5 = 1/4$, and $I_6 = 1/4$).

mately 50 was obtained in the first order at $\lambda = 0.5$ mm, and up to 750 at $\lambda = 2$ mm. The energy loss and the dependence of the Q factor on the different parameters were investigated at $\lambda = 2$ mm. The loss is estimated at $< 5 \times 10^{-4}$, and the reflection coefficient of the grid is found to be $R > 0.998$. It is concluded that similar reticular elements can be extensively used in quasi-optical apparatus for the short millimeter and submillimeter bands, and can serve as a basis for the construction of

Card 2/3

L 6491-66

ACC NR: AP5027994

2

elements that are in some sense similar to individual waveguide parts. In addition to the described Fabry-Perot interferometer, the authors constructed also a beam-splitting device with variable splitting coefficient, and a device of the Michelson interferometer type for measurements at liquid-nitrogen temperature. Authors are very grateful to Corresponding Member A. M. Prokhorov in whose laboratory this work was performed, for continuous interest and support, and to Corresponding Member N. D. Devyatkova for help during the course of this work. Orig. art. has: 1 figure and 1 table.

[02]

SUB CODE: EC/ SUBM DATE: 30Jul65/ ORIG REF: 004/ OTH REF: 002/ ATD PRESS: 4/40

bel

Card 3/3

L 5144-66 EWT(1)/EPA(s)-2/EPF(c)/EEC(k)-2/FCS(k)/EWA(h) IJP(c) WW/GG/WR
 ACCESSION NR: AP5026899 UR/0109/65/010/010/1804/1808 69
 535.854 66
 B

AUTHOR: ^{44,55} Vinogradov, Ye. A.; ^{44,55} Dianov, Ye. M.; ^{44,55} Irisova, N. A. ^{21, 44, 55}

TITLE: Michelson interferometer for measuring the refractive index of dielectrics
 in the 2-mm band ²⁵ 21, 44, 55

SOURCE: Radiotekhnika i elektronika, V. 10, no. 10, 1965, 1804-1808

TOPIC TAGS: interferometer, dielectric material

ABSTRACT: The development of a new instrument for measuring the refractive index of low-loss dielectrics in the 2-mm band is reported; the instrument is analogous to the well-known Michelson optical interferometer. Two readings, with and without the specimen in one of the instrument arms, are taken; the flat 50-mm diameter specimen is placed between the radiating horn and the movable mirror. Standard waveguide components and polystyrene lenses are used in the interferometer. Actual values of the refractive index measured by the new instrument at a wavelength of 2.31 mm are reported for teflon, alkathene, polystyrene, plexiglass, ebony, fused quartz, common salt, and glasses; these values (from 1.4 to 3.2) are compared with the data published elsewhere. Various errors involved amount to

Cord 1/2

L 5144-66

ACCESSION NR: AP5026899

small fractions of one percent. "The authors wish to thank A. M. Prokhorov for his
constant attention to this project." Orig. art. has: 2 figures, 2 formulas, and
2 tables. [03]

ASSOCIATION: none

SUBMITTED: 10Jul64

NO REF SOV: 003

ENCL: 00

OTHER: 005

SUB CODE: OP, EM

ATD PRESS: 4/34

ACC NR: AP6030721

SOURCE CODE: UR/0368/66/005/002/0251/0254

AUTHOR: Dianov, Ye. M.; Irisova, N. A.

ORG: none

TITLE: Determination of the absorption coefficient of solids in the shortwave part of the millimeter region

SOURCE: Zhurnal prikladnoy spektroskopii, v. 5, no. 2, 1966, 251-254

TOPIC TAGS: absorption coefficient, millimeter wave, dielectric material, measurement, radiation intensity, spectroscopy, SOLID STATE

ABSTRACT: A new technique for the determination of the absorption coefficient of solids is described. The principle of this technique is to measure the extreme values of the transmission coefficient T by varying the magnitude of d/λ , i.e., the ratio of the sample thickness d to the wavelength λ . The absorption coefficients of NaCl, CsJ, plexiglass, fused quartz, teflon, and K-8 glass were determined by this technique at $\lambda = 2$ mm for which the experimental error did not exceed 0.01. The new technique is intended for measuring in the presence of a clearly expressed interference image and can be applied to a wider range of substances without lowering the accuracy of the measurement results. The authors thank A. M. Prokhorov, Academician of the AN SSSR, for the use of his laboratory, constant attention, and interest in this work.

UDC: 535.341

Card 1/2

ACC NR: AP6030721

as Ye. A. Vinogradov for his help in carrying out this study. Orig. art. has: 1 figure, 1 table, and 4 formulas.

SUB CODE: 20/ SUBM DATE: 16Sep65/ ORIG REF: 003/ SOV REF: 003/ OTH REF: 003

Card 2/2

L 05634-67 EWT(1)/T LJP(c) GG

ACC NR: AP0024508

SOURCE CODE: UR/0181/66/008/007/2265/2266

58
56

AUTHOR: Dianov, Ye. M.; Irisova, N. A.

ORG: Physics Institute im. P. N. Lebedev, AN SSSR, Moscow (Fizicheskiy institut AN SSSR)

TITLE: Measurement of the refractive index of crystals with structures of the NaCl and CsCl type

SOURCE: Fizika tverdogo tela, v. 8, no. 7, 1966, 2265-2266

TOPIC TAGS: ionic crystal, refractive index, dielectric constant, temperature dependence, crystal lattice structure

ABSTRACT: To check whether the temperature coefficient of the dielectric constant depends on the type of crystal structure, the authors measured the refractive index of the ionic crystals LiF, NaCl (NaCl structure), CsBr and CsI (CsCl structure) at room and nitrogen temperatures, at 2 mm wavelength, using a Michelson interferometer described by them earlier (Radiotekhn. i elektron. v. 10, 1804, 1965). In calculating the refractive index, allowance was made for the temperature variation of their thickness. The results showed that at 2 mm wavelength the dielectric constants are close to the published static values, with the exception of CsI (6.30), which is higher than the published value (5.70) (Landolt-Bornstein, Zahlewerte und Funktionen v. 6, 452, 1959), but is close to the value obtained by others experimentally at 30 cm wavelength (6.42). This suggests that the value published in the standard tables is in error.

Card 1/2

L 05034-67

ACC NR: AP6024508

2

The change of the refractive index on going from room temperature to nitrogen temperature is larger by almost a factor of 3 in NaCl-type crystals than in CsCl-type crystals. This agrees with results by E. E. Havinga and A. J. Bosman (Phys. Rev. v. 140, 1A, A292, 1965) obtained at a different wavelength, and can be attributed to the difference in the coordination numbers of the two types of crystal structure. The authors thank A. M. Prokhorov for interest in the work and a discussion of the results, and V. N. Timofeyev for taking part in the work. Orig. art. has: 1 table.

SUB CODE: 20/ SUBM DATE: 12Feb66/ ORIG REF: 003/ OTH REF: 006

Card 2/2 *log*

L 06266-67 . . . (E) EW P(m) WH

ACC NR: AP6030962

SOURCE CODE: UR/0181/66/008/009/2643/2648

AUTHOR: Dianov, Ye. M.; Timofeyev, V. N.; Irisova, N. A.

ORG: Physics Institute im. P. N. Lebedev, AN SSSR, Moscow (Fizicheskiy institut AN SSSR)

TITLE: Measurement of the absorption coefficient of glasses in the submillimeter range

SOURCE: Fizika tverdogo tela, v. 8, no. 9, 1966, 2643-2648

TOPIC TAGS: absorption coefficient, glass property, refractive index

ABSTRACT: The absorption coefficient of two types of glass (window and type 203) was measured in the 2-0.5 mm range using a monochromatic radiation source. The device employed is described in detail. The findings are compared with those of M. D. Mashkovich and A. I. Demeshina (FTT, 7, 1634, 1965), obtained by using nonmonochromatic radiation, and with other published data. A monotonic increase of the absorption coefficient with decreasing wavelength was observed. The temperature dependence of the absorption of the glasses and of their refractive index was determined; the absorption coefficients were found to decrease linearly by a factor of approximately 2 as the samples were cooled from room to nitrogen temperature. Authors thank M. D. Mashkovich for kindly supplying the glass samples, A. M. Prokhorov for his attention

Card 1/2

L 06266-67

ACC NR: AP6030962

and interest in the work, and Ye. A. Vinogradov for his assistance. Orig. art. has:
5 figures.

SUB CODE: 20^{11/} SUBM DATE: 22Jan66/ ORIG REF: 008

Card

2/2 *eq/2*

DIANOVA, V.A.; MUSTEL', Ye.R.; PARYGIN, V.N.

Torodial cavities with ADR crystals; light modulators. Radiotekh.
i elektron. 10 no.4:770-772 Ap '65. (MIRA 18:5)

1. Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta,
kafedra teorii kolebaniy.

NIKOL'SKIY, A.N.; SULEYMANYAN, M.S.; DIANOVA, Ye.I.; MAKHON'KOVA, M.I.

Immunization reactivity in horses immunized with a diphtherial
anatoxin; effect of pilocarpine on the development of anti-
toxin in horses. Trudy Tash. NIIVS 5:139-144 '62.
(MIRA 16:10)

(HORSES) (DIPHTHERIA ANTITOXIN)
(PILOCARPINE —PHYSIOLOGICAL EFFECT)

NIKOL'SKIY, A.N.; SULEYMAN'YAN, M.S.; DIANOVA, Ye.I.; MAKHOV'KOVA, M.I.

Study of immunization reactivity in horses immunized with a
diphtherial anatoxin; preparation of horses for the produc-
tion of diphtheria serum at an early age. Trudy Tash. NIIVS 5:
145-148'62. (MIRA 16:10)

(HORSES) (DIPHTHERIA) (SERUM)

KUZNETSOV, S.I.; DIANOVA, Ye.V.; DOLGOV, G.I.

Aleksandr Semenovich Razumov (1894-1960); an obituary.
Trudy Gidrobiol. ob-va 12:417-419 '62. (MIRA 15:12).
(Razumov, Aleksandr Semenovich, 1894-1960)

MEYEROV, Mikhail Vladimirovich; DIANOV, Vladimir Gavrilovich;
GOR'KOVA, A.A., ved. red.; VORONOVA, V.V., tekhn. red.

[Theory of automatic control and automatic controllers]
Teoriia avtomaticheskogo regulirovaniia i avto-regulatory.
Moskva, Gostoptekhzdat, 1963. 416 p. (MIRA 16:9)
(Automatic control)

DIANOV, V.G.; PANTAYEV, N.F.; dots., otv. red.

[Automatic control and measuring instruments; summary of lectures for a course on "Control and measuring instruments and automatic control"] Avtomaticheskie kontrol'no-izmeritel'nye pribory; konspekt lektsii po kursu: "Kontrol'no-izmeritel'nye pribory i avtomatika." Otvetstvennyi red. Kh.F.Pantaev. Moskva, Mosk. in-t neftekhim. i gazovoi promyshl. 1962. 89 p.
(MIRA 18:3)

DEVOCHKIN, F.A., kand. sel'skokh. nauk, dotsent; DIANOV, V.I., aspirant;
EDEL'SHTEYN, V.I., pochetnyy akademik, nauchnyy rukovoditel'

Cotton plants in sowing under paper strips. Izv. TSKHA no.1:
7-11 '63. (MIRA 16:7)

1. Vsesoyuznaya akademiya sel'skokhozyaystvennykh nauk Imeni
Lenina (for Edel'shteyn).
(Cotton growing) (Mulching)

DIANOV-KLOKOV, V. I.

USSR/ Physics - Instruments

Card 1/1. Pub. 43 - 33/97

Authors : Dianov-Klokov, V. I.

Title : Automatic spectrophotometer - spectrograph attachment

Periodical : Izv. AN SSSR, Ser. fiz. 18/2, page 265, Mar-Apr 1954

Abstract : The development of an automatic spectrophotometer, which operates on the principle of direct measuring the intensity ratio by a purely electrical method, is announced. The modulation frequency in this spectrophotometer was fixed at 1000 cps. The variable voltage component originating on the photoelement load is amplified by a four stage amplifier with transformer output; maximum amplification coefficient of this amplifier is set at $1.6 \cdot 10^0$. Time required for the obtainment of a spectrogram is 8 - 15 seconds.

Institution : Academy of Sciences USSR, Institute of Organic Chemistry

Submitted :

DYANOV-KLOKOV, V.I.

DYANOV-KLOKOV, V.I.; SHIVALOV, Ye.A.

~~SECRET~~
An automatic-flow refractometer. Izv. tekhn. no.2:42-45 Mr-
Ap '55. (MLRA 8:9)

(Refractometer)

DIANOV-KLOKOV, V. I.

Category : USSR/Electricity - Dielectrics

G-2

Abs Jour : Ref Zhur - Fizika, No 1, 1957 No 1523

Author : Palitsyna, I.A., Dianov-Klovov, V.I.

Title : Simple Instrument for Simultaneous Measurement of the Dielectric Coefficient and the Loss Angle.

Orig Pub : Izmerit. tekhnika, 1955, No 4, 35-36

Abstract : The operation of the instrument is based on measuring the phase difference of voltages in two tuned circuits, which are loosely and symmetrically coupled to a high frequency generator. Connecting one of these circuits in parallel with a standard variable capacitor of unknown capacity C_x disturbs the quality of the phases. The value of C_x is determined from the difference in the reading produced by a standard capacitor when the measured capacity is connected in the circuit and disconnected. The change in Q produced by connecting C_x makes it possible to determine simultaneously the value of $\tan \delta$ of the investigated substance from the change in the slope of the curve on the oscillograph screen. The relative sensitivity of the instrument is 3.5×10^{-4} . The minimum capacitance detectable is 0.02 micromicrofarads. The operating frequency of the oscillator is 1000 kc. The instrument is fed from an ac line (without voltage stabilization).

Card : 1/1

DIANOV-KLOKOV, V.I.

Regularities in the absorption spectrum of liquid oxygen in the
6300-3150A range. Dokl. AN SSSR 105 no.2:290-293 '55. (MLRA 9:3)

1. Moskovskiy inzhenerno-fizicheskiy institut. Predstavleno
akademikom P.A. Rebinderom.
(Oxygen--Spectra)

DIANOV-KLOKOV, V. I.

The intensity relations of liquid-oxygen absorption band, 6300-3150 Å., concentration in mixtures with liquid nitrogen, V. I. Dianov-Klokov (Eng.-Phys. Inst., Moscow). Dokl. Akad. Nauk S.S.S.R. 105, 601-6 (1955); cf. preceding abstract. The absorption-band intensity changes much more than proportionally to its concn. in mixt. with liquid N (at 78° K.), which indicates some interaction between the 2. The band intensity changes are somewhat higher than corresponds to any possible (O₂)² concn. The change cannot be explained by a 2O₂ → (O₂)₂ assocn.

W. M. Sternberg

PM

Dianov-Klokov V.I.
USSR, Physical Chemistry - Moscow, Chemical Bond.

B-4

Abs Jour : Referat Zhur - Khimiya, No 6, 25 March 1957, 18138

Author : Dianov-Klokov, V.I.

Title : Absorption Specter of Liquid Oxygen and Its Mixtures
with Nitrogen in the Region of 10600-2800 A.

Orig Pub : Optika i spektroskopiya, 1956, 1, No 5, 650-657

Abstract : Absorption indices of the bands of spectrum of liquid oxygen in the region of 10600-3000A are measured. Distribution of intensities confirms the right way of grouping the bands according to the plan of Ellis-Kneser (Ellis J.M. and Kneser H.O., Z. Phys. 1933, 86, 583). Preliminary measurements of temperature dependence of intensities show that bands answering, in the Ellis-Kneser plan, the "symmetrical" two-electron displacements are the most sensitive to temperature. In mixtures with nitrogen the intensities of all the bands which were examined, at the exception of 7640 and 6890A ($3\Sigma^- - 1\Sigma^-$)

Card 1/2

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USSR/Physical Chemistry - Molecule. Chemical Bond.

B-4

Abs Jour : Referat Zhur - Khimiya, No 6, 25 March 1957, 18138

change quite identically depending on the content of oxygen which allows us to suppose that they have common mechanisms of origin. Two new, and the most short-wave, bands 3140 and 3030A, which have been found belong, both by their position and by their intensities, within the limits of errors of measurements, to the group $2^3\Sigma^- - 2^1\Sigma$ of Ellis-Kneser plan. Three new long-wave members of a "triplet" progression (2921, 2989 and 3061A) overlap the bands of Ellis-Kneser. The construction of the dishes used for photometrical operations is described in detail.

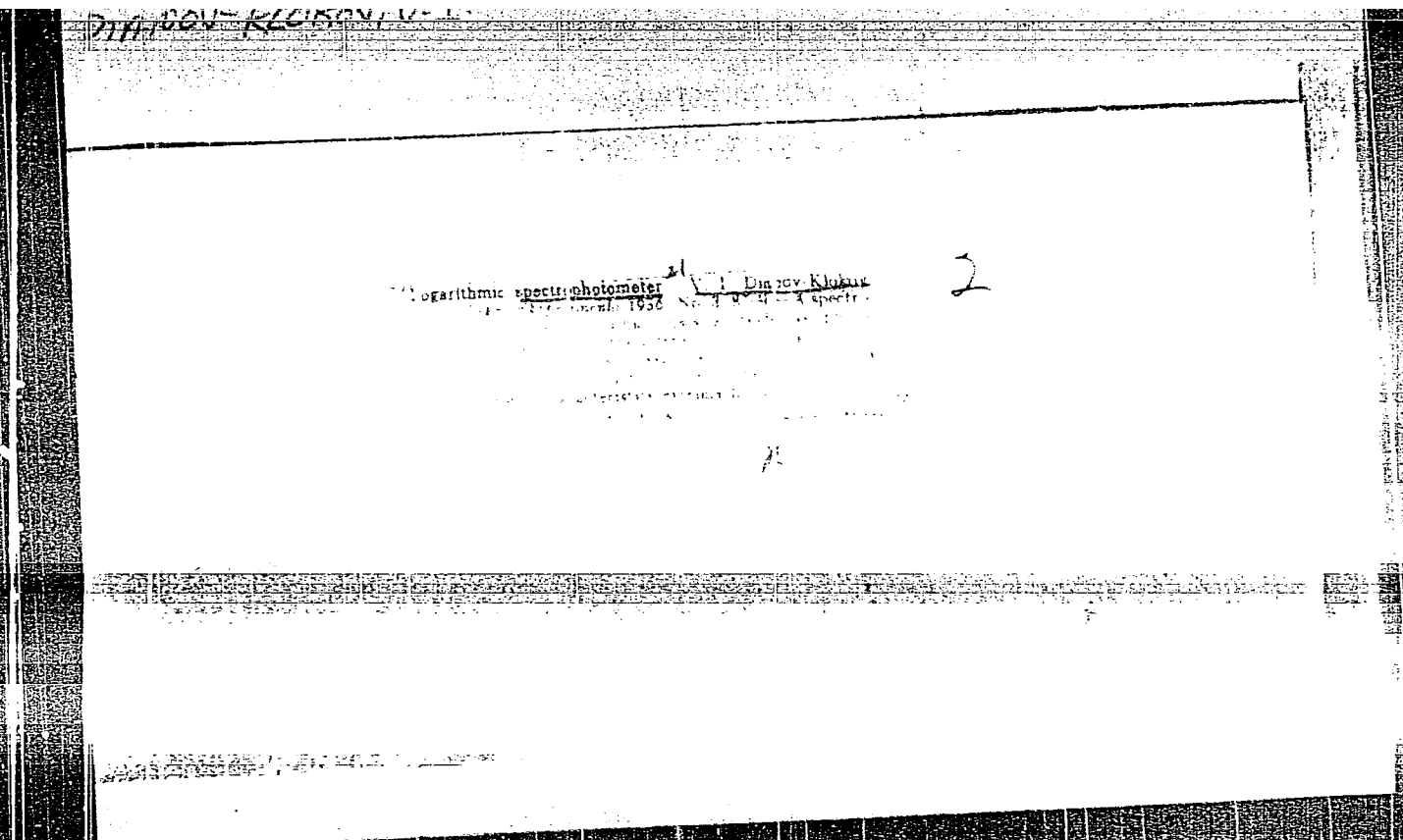
Card 2/2

- 18 -

DIANOV-KLOKOV, V. I.

phys ✓ Absorption spectrum of liquid oxygen in mixtures with argon and krypton (11,000-3300 Å.). V. I. Dianov-Klovkov. *Optika i Spektroskopiya* 1, 862-6 (1958). The relation between the intensity of the absorption spectrum of liquid O and its molar concn. c_2 in A-Kr mixts. was investigated at 77.3°K. in the 10,600-3300-Å. region by the method previously described (cf. V. I. Dianov-Klovkov, C.A. 50, 6199). The extinction coeffs. (ϵ_2) of O bands were dependent on the c_2 in a nonlinear manner and were different for each mixt. (N, Kr, A). The diln. of O resulted in an over-all weakening of the spectrum, though the half-width and the shape of bands remained unchanged. The exceptions were bands at 7049 and 6890 Å., the intensities of which increased relatively at low c_2 . In mixts. with N this effect was more pronounced at higher concns. than in mixts. with A. For the band at 5769 Å. with molar fractions of mixts. $\mu_N = 0.18$, $\mu_K = 0.205$, $\mu_A = 0.26$, and $\epsilon_2 = 0.040 \text{ cm}^{-1}$. A. P. Kotloby

correction
1. Diet. elementsoyrganicheskikh soedineniy Akademii Nauk
SSSR (Oxygen Spectra) (Argon Spectra)
(Krypton Spectra)



DIANOV-KLOKOV V.I

Category : USSR/Optics - Optical Methods of Analysis. Instruments

K-7

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 5156

Author : Dianov-Klokov, V.I.

Inst : Institute of Elements and Organic Compounds, Academy of Sciences USSR

Title : Spectral Determination of Small Impurities of Nitrogen in Gaseous Argon.

Orig Pub : Zavod. laboratoriya, 1956, 22, No 4, 444-447

Abstract : Description of a spectral method (photographic and photo-electronic) for the determination of small impurities (0.01 -- 1%) of nitrogen in gaseous argon. The radiation spectrum is excited in a Geissler tube, fed from the line through a step-up transformer. The mixture under investigation is continuously pumped through the discharge device at a constant pressure of 100 mm mercury. A visual estimate of the blackening permits determination of the nitrogen contents within a range $C_{N_2} = 0.1 \text{ -- } 1\%$, and it being preferable to use for the comparison the nearby bands of N_2 and the following argon lines: 3949 A (Ar) and 3943 A (N_2) at $C_{N_2} = 0.1 \text{ -- } 0.2\%$; 4044.42 A (Ar) and 4059.4 A (N_2) at $C_{N_2} = 0.4 \text{ -- } 0.5\%$.

To obtain objective control, the author uses a simple photo-electronic analyzer, containing two FEU-19 photomultipliers, the loads of which

Card : 1/2

Category : USSR/Optics - Optical Methods of Analysis. Instruments

K-7

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 5156

(50 megohms) are connected directly to mutually-perpendicular deflecting plates of a cathode-ray tube. CN_2 is determined directly from the glowing line on the screen (within a range 0.01 -- 0.5%). The photomultipliers are fed from a common voltage divider using a stabilized rectifier.

Card : 2/2

DIANOV-KLOKOV, V.I.

PRIKHOT'KO, A.F.

24(7) 13 PHASE I BOOK EXPLOITATION 507/1365

L'vor. Universitet

Materialy X Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'viv] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Its: Fizichnyy zbirnyk, vyp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Gazer, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Landsterg, G.S., Academician (Resp. Ed., Deceased), Nepront, B.S., Doctor of Physical and Mathematical Sciences, Fabelinskiy, I.L., Doctor of Physical and Mathematical Sciences, Fabrikant, V.A., Doctor of Physical and Mathematical Sciences, Kornitskiy, V.G., Candidate of Technical Sciences, Rayskiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.R., Candidate of Physical and Mathematical Sciences, Milyanovich, V.S., Candidate of Physical and Mathematical Sciences, and Glauberman, A. Ye., Candidate of Physical and Mathematical Sciences.

Card 1/30

| | |
|---|-----|
| Dianov-Klokov, V.I., and A.D. Stakhovskiy. Registering Device for Infrared Spectrometers | 401 |
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DIANOV-KLOKOV, V.I.; STAKHOVSKIY, A.D.; OSTERMAN, L.A.
~~SECRET~~

Amplifier input units for bolometers and thermocouples. Izv. tekhn.
no.2:37-41 Mr-Ap '57. (MLRA 10:6)
(Bolometer) (Amplifiers, Electron-tube) (Thermocouples)

Dianov-Klovov, V.I.

120-4-23/35

AUTHOR: Dianov-Klovov, V.I. and Stakhovskiy, A.D.

TITLE: A Double-beam Recording Apparatus for an Infra-red Spectrometer (Dvukhluchevoye registriruyushcheye ustroystvo k infrakrasnomu spektrometru)

PERIODICAL: Priory i Tekhnika Eksperimenta, 1957, No.4, pp. 82 - 84 (USSR)

ABSTRACT: The so-called "phase" method of measurement of relative intensities, which has been previously used for ultra-violet and visible light (Refs. 4-6) is used in this equipment. The method has been used for the infra-red region by Golay (Ref.7), but his apparatus is very complicated. The block diagram is given in Fig.1. A disc-perforator, rotated by a synchronous motor, interrupts two beams of light (the working and the reference beams) at a frequency of 20 c.p.s. with a phase difference of 90° . Both beams fall onto a nickeliferous bolometer (impedance 10 - 20 Ω , sensitivity 0.3 - 0.5 V/Watt, $\tau \approx 0.02$ sec.) and the phase of the resulting signal voltage depends on their relative intensities. This voltage, after amplification in a pre-amplifier, passes through the main amplifier to a phase detector to which is also applied a reference voltage from the induction generator directly coupled to the perforator. The output voltage of the phase detector

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120-4-23/35

A Double-beam Recording Apparatus for an Infra-red Spectrometer

depends only on the phase difference between the signal voltage and the reference voltage, and thus indicates the relative intensities. Because the output signal is related to the transparency of the sample in a non-linear manner, a simple linearising circuit follows the detector. The linearised output signal is passed to a valve voltmeter and to a pen recorder. The signal and reference voltages are also displayed on a miniature oscillograph. The circuit is given in Fig. 2. A sample spectrogram obtained with a prism of NaCl at the highest sweep speed is given in Fig.4. There are 4 figures and 9 references, 5 of which are Slavic.

ASSOCIATION: Institute of ~~Elemental~~-organic Compounds Ac.Sc. USSR
(Institut elementoorganicheskikh soyedineniy AN SSSR)

SUBMITTED: February 23, 1957

AVAILABLE: Library of Congress
Card 2/2

DIANOV - KLOKOV, V. I.

AUTHORS: Dianov-Klokov, V.I., and Kolbasov, V.A.

120-5-23/35

TITLE: Bi-directional Photo-electric Interference-band Recorder
(Dvunapravlenyy fotoelektricheskiy registrator
interferentsionnykh polos)

PERIODICAL: Priory i Tekhnika Eksperimenta, 1957, No. 5,
pp. 95 - 99 (USSR).

ABSTRACT: The changing phase of the interference pattern is converted into a moving electric vector. A previous attempt at such an instrument (Ref.2) was successful only when the phase of the pattern changed monotonically. The present apparatus will also deal with changes in direction, and is intended for use with the proton refractometer due to Obreimov (Ref.1). It was developed in the optical laboratory of the INEOS Ac.Sc. USSR. Three photocells are used to receive the light. One receives the total flux, the other two receive light split equally by a wedge located opposite a narrow slit. By suitably combining the outputs of the cells, it is possible to derive signals proportional to the sum and difference of illuminations from symmetrical parts of an interference band. These component signals define a rotating electric vector. Fig. 2 shows how the modulus of this vector is affected by

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120-5-23/35

Bi-directional Photo-electric Interference-band Recorder.

the fraction of the interference band intercepted by the slit. The light source is a mercury arc fed from the mains and thus modulated at 100 c.p.s. Fig. 3 is a block diagram showing how the modulated output currents from cells type $\Phi\Phi Y-25$ are added and phase shifted $\pm 45^\circ$, passed through a tuned amplifier with a.g.c. to remove changes in signal strength and applied to the rotor of the synchronous indicator type BT-3. The complete circuit diagram of Fig. 4 with component values shows the use of a transformer as smoothing choke in the power pack. The 100 c.p.s. ripple voltage across the secondary of the transformer feeds the stator of the indicator. The position of the interference pattern can be located to within 5 - 10% of a period when it is changing at a rate of 5 periods/sec. Seven valves are used. Assistance was received from Ye.A. Shibalov, D.D. Brezhnev, Zvagel'skiy, F.G. There are 4 figures and 5 references, 4 of which are Slavic.

ASSOCIATION: Institute for Elemental-organic Compounds Ac. Sc.
USSR (Institut elementoorganicheskikh soyedineniy
AN SSSR)

SUBMITTED: March 7, 1957.

AVAILABLE: Library of Congress
Card 2/2

DIANOV-KLOKOV, V.I

24(7)

PLANE I BOOK EXPLOITATION

L'ov. Universitet

Materialy I Vsesoyuznogo soveshchaniya po spektroskopii, 1956.
t. II: Atomnaya spektroskopiya (Materials of the 10th All-Union
Conference on Spectroscopy, 1956. Vol. 2: Atomic Spectroscopy)
Moskva: Izdatel'stvo fizmatgiz, 1958. 568 p. (Series: Itsi
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Editorial Board: G.S. Landsberg, Academician, (Resp. Ed.);
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(deceased), Doctor of Physical and Mathematical Sciences;
G. Shcheglov, Doctor of Physical and Mathematical Sciences;
M.I. G. Gerasimov, Tech. Ed.; V.V. Saranyuk.

FOREWORD: This book is intended for scientists and researchers in
the field of spectroscopy as well as for technical personnel
using spectrum analysis in various industries.

CONTENTS: This volume contains 177 scientific and technical studies
of atomic spectroscopy presented at the 10th All-Union Confer-
ence on Spectroscopy in 1956. The studies were carried out by
members of scientific and technical institutes and include
extensive bibliographies of Soviet and other sources. The
studies cover many phases of spectroscopy: methods for controlling
electromagnetic radiation, physical and chemical methods for controlling
uranium production, physics and technology of gas discharge,
optics and spectroscopy, absorption methods for quantitative spectrum
spectroscopy and the comparison theory, spectrum analysis of ores
and minerals, photoacoustic alloys, spectral determination of the
analysis of metal alloys by means of isotopes, tables, and
hydrogen content of metals by means of isotopes, tables, and
statistical study of variation in the parameters of calibration
curves, determination of traces of metals, spectrum analysis in
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practice of spectrochemical analysis.

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Card 10/31

DIANOV-KLOKOV, V.I.

AUTHORS: ~~Dianov-Klokov, V.I., Candidate of Physical-Mathematical Sciences, Kolbasov, V.A., Engineer, Lemarin'ye, K.N., Engineer~~ 67-58 -2-11/26

TITLE: The Spectral Analysis of Nitrogen in Argon (Spektral'noye opredeleniye primesey azota v argone)

PERIODICAL: Kislород, 1958, Nr 2, pp. 49-51 (USSR)

ABSTRACT: It is said in the introduction that this method has proved to be of practical use in Soviet plants. However, the apparatus used for this purpose have certain disadvantages as a result of which inaccurate results are obtained in individual cases. In order to prevent this, it is recommended in the course of this paper that the light sensitiveness of this apparatus be increased by summation of loads. In this case the individual pulses of the photocurrent are collected during the period of from 10-20 seconds in loading condensers. Meanwhile, the luminescent spot produces a straight line, the "arrow", the angle of which can easily be computed. The oscillographic tube "8 L039" has a screen with afterglow, so that the "arrow" can be conserved for 1 minute. Centering of the beam is brought about by means of two revolving deflection coils.

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The Spectral Analysis of Nitrogen in Argon

67-58-2-11/26

Rough adjustment of the two analyzer channels is carried out by switching over the loading condensers, and fine adjustment is brought about by diaphragming the slots before the photomultipliers. In the rectifier of the feed block ferroresonance stabilization is applied. Selenium rods (ABC-7-3P) serve as valves. In the case of particularly pure gases it is recommended to use a collection of suitable filters instead of spectrographs. There are 3 figures, 3 references, all Soviet.

AVAILABLE: Library of Congress

1. Nitrogen--Spectrum
2. Argon--Applications
3. Laboratory equipment--Operation

Card 2/2

Dianov-Klokov, V.I.

AUTHOR: Dianov-Klokov, V. I., Candidate of Physical-Mathematical Sciences

67-58-2-17/26

TITLE: An Ultrasonic Gas Analyzer (Ul'trazvukovoy gazoanalizator)

PERIODICAL: Kislород, 1958, Nr 2, pp. 73-74 (USSR)

ABSTRACT: The author refers to the paper by M. Kniazuk and F. Prediger (Instruments and Automation, Nov. 1955, pp. 1916-1917) and gives the description of such an analyzer which was published in Control Engineering, 1957, March, p. 138 on the basis of the schematic representation of the apparatus itself as well as of its electrical part, which is dealt with separately. The author remarks in this connection that in spite of the manifold character of various data which can be read off from the apparatus itself, operation of the apparatus is by no means rendered more difficult. The author concludes by saying that the firm of Merck and Co produces apparatus of this type with the only exception that the scheme of the phase switch is replaced by a regulator, and the calibrated limb by an indicator of numbers. There are 2 figures, and 1 English reference.

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67-58-2-17/26

An Ultrasonic Gas Analyzer

AVAILABLE: Library of Congress

1. Gas analyzers--applications

Card 2/2

Sov/51-4-4-4/24

AUTHOR: ~~Dianov-Klokov, V.I.~~

TITLE: Absorption Spectrum of Liquid Oxygen in the Temperature Range 77 - 153 °K (12 600 - 3 300 Å) (Spektr pogloshcheniya zhidkogo kisloroda v intervale temperatur 77-153 °K (12,600 - 3 300 Å))

PERIODICAL: Optika i Spektroskopiya, 1958, Vol IV, Nr 4, pp 448 - 454 (USSR).

ABSTRACT: The origin of the forbidden absorption spectrum of compressed and liquid oxygen in the spectral region 12 600 - 3 000 Å, which was studied already in the last century (Ref 1), is still not very clear. The hypothesis of Ellis and Kneser (Ref 2) on two-electron transitions in a "collision pair" of O₂ molecules explains satisfactorily the band distribution in the spectral region in question and it can be regarded as proved experimentally. It is not yet clear, however, whether the bands in the 12 600 - 3 000 Å region are due to one molecular complex or are due to a number of such complexes. The relationship between spectral and magnetic properties of oxygen is also not clear. The author studied changes in the intensities of absorption bands of liquid oxygen in the spectral region 12 600 - 3 300 Å at temperatures from 77.8

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Sov/51-4-4-/24

Absorption Spectrum of Liquid Oxygen in the Temperature Range
77 - 153 °K (12 600 - 3 300 Å)

to 153 °K. The results obtained were compared with the results of study of concentration dependence of the intensities of these bands in mixtures of oxygen with other elements (Refs 6, 12, 13). The author used the same rapid action two-beam spectrophotometer as was used in earlier work (Refs 7, 13). Absorption was measured in layers of thickness $l = 2.15$ and 10 cm. The cells used (Figure 1) had solid copper body with a copper "tongue". The rate of heating of the cell was regulated by change of depth of immersion of this "tongue" in a Dewar flask containing liquid nitrogen. Liquid nitrogen was used to liquefy oxygen of 99.99.5% purity. On heating of the cell 15-20 spectral records were obtained at successive rising temperatures. Heating was carried out slowly and it took 1 - 1.5 hrs. In the majority of cases, only the coefficients of extinction (ϵ_m) were measured at the band maxima.

Integral absorption coefficients were determined only for the 12 600 and 10 600 Å bands. Figure 2 shows the results of measurements of the coefficients of extinction which are shown as a function of temperature. The ordinate axis gives the Card2/8 value of ϵ_m/ρ , where ρ is the density of liquid oxygen.

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Absorption Spectrum of Liquid Oxygen in the Temperature Range
77 - 153 °K (12 600 - 3 300 Å)

Curves 2 - 14 in Figure 2 represent measurements at various wavelengths. From Figure 2, it follows that, within the limit of experimental error, the intensities of bands in each of the five Ellis-Kneser groups (Ref 7) change in the same way with change of temperature. These five groups are: (${}^3\Sigma \rightarrow {}^1\Delta$; ${}^3\Sigma \rightarrow {}^1\Sigma$; $2^3\Sigma \rightarrow 2^1\Delta$; $2^3\Sigma \rightarrow {}^1\Delta + {}^1\Sigma$; $2^3\Sigma \rightarrow 2^1\Sigma$). Comparison of the curves ϵ_m/ρ and $\rho(T)$, the latter shown as Curve 1 in Figure 2, shows that they are similar. It follows that change of the liquid density is an essential factor in the change of the absorption intensity. Figure 4 shows the absorption spectra of 99.5% pure liquid oxygen in the 9 000 - 13 000 Å spectral region. The three records were obtained at 77.8 °K (Figure 4a), 142 °K (Figure 4b) and 153.5 °K (Figure 4v). The author found the dependence of the extinction coefficient ϵ_m for the 12 600, 10 600 Å and other bands on the content of oxygen in a mixture with nitrogen at $T = 77.8$ °K

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Sov/51-4-4-4/24

Absorption Spectrum of Liquid Oxygen in the Temperature Range
77 - 153 °K (12 600 - 3 300 Å)

(Figures 3 and 5). The ratio of the intensities of the 12 600 and 10 600 Å bands agrees with the results obtained by Cho and his co-workers (Ref 6). Figures 3 and 5 shows that in molecules of O₂ in the liquid state the electron transition $3\Sigma \rightarrow 1\Delta$ is possible without vibrations and the probability of this transition is independent of the interaction between O₂ molecules. The difference between the concentration and temperature dependences of the absorption band intensities shows particularly on dilution of oxygen in its mixture with nitrogen when the whole oxygen spectrum becomes weaker (with the exception of the 12 600, 7 640 and 6 890 Å bands), while when temperature is varied, separate groups of bands behave differently (Figure 5). To explain this effect, we may assume that the weakening of the spectrum in mixtures is mainly due to a decrease in the number of associations without any essential change in their nature, while on thermal expansion of oxygen either the associational structure itself or the nature of its interactions with its neighbours are altered. Small differences

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Sov/51-4-4-4/24

Absorption Spectrum of Liquid Oxygen in the Temperature Range
77 - 153 °K (12 600 - 3 300 Å)

between curves obtained using various solvents for oxygen (Figure 6) may be related to differences in the geometrical "packing" conditions. It is suggested that both in liquid and compressed oxygen only one complex or "dimer", $(O_2)_2$, with negative exchange interaction is responsible for the absorption spectra studied in this paper. Presence of such complexes agrees with the assumption of anti-ferromagnetic properties for solid oxygen (Refs 18-20). In compressed oxygen, the number of complexes should be of the same order as in liquid oxygen at the same density. The author thanks I.V. Obreimov for his advice and D.D. Brezhnev and R.V. Rumyantseva for their help. There are 6 figures and 23 references, 9 of which are Soviet, 3 French, 3 Dutch, 2 German and 6 in English.

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Absorption Spectrum of Liquid Oxygen in the Temperature Range
77 - 153 °K (12 600 - 3 300 Å)

Sov/51-4-4-4/24

ASSOCIATION: Institut elementoorganicheskikh soedineniy AN SSSR
(Institute of Elemental-organic Compounds, AS USSR)

SUBMITTED: June 8, 1957

Card 6/6 1. Oxygen--Spectra

9.6150

S/035/60/000/010/010/021
AOO1/AOO1

Translation from: Referativnyy zhurnal, Astronomiya i Geodeziya, 1960, No. 10,
p. 23, # 9917

AUTHOR: Dianov-Klovov, V. I. *nl*

TITLE: Logarithmic Spectrophotometer for Visible and Ultraviolet Ranges

PERIODICAL: Fiz. sb. L'vovsk. un-t, 1958, No. 4 (9), pp. 135-139

TEXT: A recording device for the spectrophotometer with a logarithmic scale is described. A conventional diode of 6Д4Ж (6D4Zh) type, connected as a load of a photomultiplier, performs the operation of taking logarithms. The layout of the amplifier and synchronous detector is presented, as well as the block-diagram of the whole device. *✓B*

O. D.

Translator's note: This is the full translation of the original Russian abstract.

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5/3

SOV/120-59-2-13/50

AUTHOR: Dianov-Klovov, V.I.

TITLE: An Automatic "Phase" Spectrophotometer for the Region
0.21-2.5 μ (Avtomaticheskii 'fazovyy' spektrofotometr
dlya oblasti 0.21-2.5 mk)

PERIODICAL: Pribery i tekhnika eksperimenta, 1959, Nr 2, pp 45-49
(USSR)

ABSTRACT: A modified form of a double beam "phase" spectrophotometer for the region 0.21 - 2.5 μ is described. An FEU-25 photomultiplier with a deposited sodium salicylate film and a FS-A1 photoresistor is used as the detector. The spectrogram can be obtained in 0.5-1 min. The prototype of this spectrophotometer was described in Refs 4 and 5. The instrument uses a single quartz prism and the beams which are compared are modulated at 1 kc/s, the phase difference between the modulators being 90°. The phase of the amplified signal is measured by a phasemeter described in Ref 5. The voltage input to the phasemeter is proportional to the required ratio of intensities. The resolution is 0.5, 4 and 30 m μ for 0.25, 0.7 and 2 μ respectively. Specimen spectrograms are shown in Fig 4. The basic circuit of the

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SOV/120-59-2-13/50
An Automatic "Phase" Spectrophotometer for the Region 0.21-2.5 μ
instrument is shown in Fig 2.
There are 4 figures and 6 references, of which 4 are
Soviet and 2 are English.

ASSOCIATION: Institut elementoorganicheskikh sovedineniy AN SSSR
(Institute of Elemental- Organic Compounds, Ac.Sc.
USSR)

SUBMITTED: April 29, 1958

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24(7)

SOV/51-6-4-8/29

AUTHOR: Dianov-Klokov, V.I.

TITLE: On the Origin of the Spectrum of Liquid and Compressed Oxygen
(12600-3000 Å) ((K voprosu o proiskhozhdenii spektra zhidkogo i
schatogo kisloroda (12600-3000 Å)))

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 4, pp 457-462 (USSR)

ABSTRACT: To explain the origin of the absorption spectrum of condensed oxygen in the region 12600-3000 Å it is necessary to decide whether the spectrum is due to a pair of interacting molecules (O₂)₂ or to one molecule O₂. To answer this question, the author investigated the temperature and density dependences of the intensity of absorption bands of condensed oxygen. The effect of temperature on the oxygen spectrum at constant density was studied by means of a cell in which the pressure of up to 5000 atm could be produced (Fig 1). L.D. Lifshits advised on the construction of the cell. The absorbing layer thickness was $l = 2.05$ cm. After cooling the cell with liquid nitrogen, which was poured into the outer jacket 7, oxygen of 98.5-99% purity was liquefied in the working part of the cell. A series of spectrophotograms (15-30 records) was obtained in the process of natural warming up of the condensed oxygen. The range of temperatures investigated was from

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SOV/51-6-4-8/29

On the Origin of the Spectrum of Liquid and Compressed Oxygen (12600-3000 Å)

80 to 250°K. Temperatures were measured by means of a thermocouple soldered to the cell. The oxygen density was determined from the first spectrophotograms of the series recorded in the presence of liquid nitrogen in the jacket. The effect of thermal expansion and consequent deformation of the cell on the oxygen density was not allowed for. At the density of 1.17 g/cm³ the maximum pressure in the cell reached 3500 atm. Figs 2 and 3 show respectively the results of measurements of the absorption-coefficient maximum (Fig 2) and the band half-widths (Fig 3) as a function of temperature at a constant oxygen density of 1.17 g/cm³. The results shown in Fig 2 agree satisfactorily with the data reported by Robin et al (Ref 7). Because the resolving power of the spectrophotometer used was low, the measured values of the half-widths are somewhat higher than the true values at temperatures below 100°K; nevertheless Fig 3 shows clearly that the band widths increase with temperature. The distribution of intensities and the temperature coefficients agree with the assumption that the absorption spectrum of condensed oxygen in the region 12600-3000 Å is almost entirely due to the dipole transitions in "statistical" complexes (O₂)₂. Acknowledgments

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On the Origin of the Spectrum of Liquid and Compressed Oxygen (12600-3000 Å)

are made to I.V. Obreimov, L.S. Mayants and Ch.K. Mukhtarov for their advice, to D.D. Brezhnev and R.V. Rumyantseva for their help in construction of the cell and to N.A. Chumayevskiy for his help in recording the spectra. There are 4 figures and 12 references, 4 of which are Soviet, 1 English, 5 French, 1 Italian and 1 translation from English into Russian.

SUBMITTED: April 30, 1958

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24-3420

66582

SOV/51-7-5-6/21

AUTHOR: Dianov-Klokov, V.I.

TITLE: The Absorption Spectrum (12600-3000 Å) of Liquid and Solid Oxygen Under Pressure

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, Nr 5, pp 621-625 (USSR)

ABSTRACT: The author determined directly the effect of the density of condensed oxygen on the intensity of its spectrum between 12600 and 3000 Å at constant temperature. A cell used in these experiments was described earlier (Ref 15); the present version did not have a needle valve. The working volume of the cell was altered by displacement of a piston with Teflon and copper rings. In each experiment a new set of rings (they had the form of truncated cones) was used. The cell was placed in a spectrophotometer, evacuated and filled with gaseous oxygen at 200-400 mm Hg. Liquid nitrogen was poured into a cooling jacket round the cell, the piston was moved inwards 2-3 mm and oxygen was liquefied in the cell. After 15-20 min at a given pressure thermal equilibrium was assumed to be established and spectra were recorded using a phase spectrophotometer (Ref 18) fitted with three receivers: a photo-multiplier R-3 and photocells TsG-4 and FS-A1 (photoconductive). Temperature in the cell was deduced from the initial spectrograms (no pressure) and known thickness of the layer, using the data reported

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The Absorption Spectrum (12600-3000 Å) of Liquid and Solid Oxygen Under Pressure

earlier (Ref 19). Deformations of the cell and the piston were not allowed for in calculations of the volume changes. The cell was fitted with carefully polished fused-quartz windows. Contact between the windows and metal parts was avoided by the use of Teflon spacers (Fig 1). The procedure described here ensured a satisfactory seal at the piston and high purity (98-99%) of oxygen. The results are shown in Fig 2 in the form of dependence of the absorption coefficients (in cm^{-1}) at the band maxima, ϵ_m , on the density at $T = 86^\circ\text{K}$. The densities ranged from 1.16 g/cm^3 at the beginning of these experiments to 1.61 g/cm^3 at 8000 atm. Several spectrograms are shown in Fig 3. Fig 2 shows that the absorption intensity of different band groups varies differently with ρ but is always very large: for example for the 6290 Å band $\epsilon_m \sim \rho^{4.9}$ in the liquid-phase region; this is not far from the result ($\epsilon_m \sim \rho^{4.7}$) obtained by varying temperature (Ref 18). As in the case of T being variable and $\rho = \text{const.}$ (Ref 15), the bands corresponding to electron-vibrational transitions (10600 Å in group I, 5325 and 5769 Å in group III, 3612 and 3285 Å in group V - classification of these bands is given in Ref 15) were most strongly affected. Purely electron transitions (12600, 6290 and 3808 Å) were less sensitive to applied pressure. The least affected was the 7640 Å band, 40% of whose intensity

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The Absorption Spectrum (12600-3000 Å) of Liquid and Solid Oxygen Under Pressure

is due to "independent" transitions in O_2 molecules. All these data agree with the suggestion that the spectrum is due to $(O_2)_2$ complexes, which interact strongly with their neighbours. The graphs of $\epsilon_m = f(T)$ at $\rho = \text{const.}$ differ from the graphs $\epsilon_m = f(\rho)$ at $T = \text{const.}$: in the first case the "non-symmetric" bands of groups I, II and IV are more strongly affected and in the second case the effect is greater in the "symmetric" bands of groups III and V. This is due to the predominant role of the ordering of molecular positions on increase of the density ρ . Fig 3 shows that increase of the oxygen density produces a sharper cut-off at the red edge of the absorption bands due to decrease of the possibility of rotational and torsional vibrations with increase of density. The observed rise of the absorption band intensities on increase of ρ cannot be satisfactorily explained by an increase in the effective number of mutually compensated spins (Ref 19). The magnetic susceptibilities of liquid and solid (γ -phase) oxygen differ only slightly and consequently the rise of intensity must be strongly affected by some perturbations. From the $\epsilon_m = f(\rho)$ the author determined the discontinuous volume changes

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SOV/51-7-5-6/21

The Absorption Spectrum (12600-3000 Å) of Liquid and Solid Oxygen Under Pressure

on transitions from liquid to γ -phase and from γ -phase to β -phase. Acknowledgments are made to I.V. Obreimov, A.I. Kitaygorodskiy, Ch.K. Lukhtarov and L.D. Lifshits for their advice and to D.D. Brezhnev, V.I. Lantsov and R.V. Rumyantseva for their help in making the apparatus and carrying out the measurements. There are 3 figures and 22 references, 9 of which are Soviet, 4 English, 6 French, 2 German and 1 Italian.

SUBMITTED: April 17, 1959

Card 4/4

DIANOV-KLOKOV, V.I.

Portable χ -meter. Razved. i prom. geofiz. no.27:74-79 '59.
(MIRA 12:7)
(Magnetometer) (Rocks--Magnetic properties)

9.6000

S/049/60/000/01/018/027

E201/E191

82248

AUTHOR: Dianov-Klokov, V.I.TITLE: Apparatus for Measuring Weak Remanent Magnetization of Rocks

PERIODICAL: Izvestiya Akademii nayk SSSR, Seriya geofizicheskaya, 1960, No 1, pp 142-147

TEXT: The author describes a new "rock-generator" (Refs 1-3) for measurement of weak remanent magnetization of rocks. The aim was to produce an instrument² as sensitive as that of Johnson et al. (Ref 2) but simpler in construction and more compact. The instrument employs demagnetizing action of a.c. currents. A 24 x 24 x 24 mm sample (2 in Fig 1) rotates at 40 rev/sec in a pressboard ("press-spahn") cylinder on which two coils (1 in Fig 1) are wound. The unit is triply shielded by two Permalloy (4 and 5 in Fig 1) and one copper screen (6 in Fig 1). The sample is fixed in a light Plexiglas (perspex) holder (7 in Fig 1) by means of a caprone loop (3 in Fig 1). The detection and measuring circuit (Fig 2) of the instrument is based on the recording part of an infrared spectrophotometer (Ref 4). The final signal is read

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S/049/60/000/01/018/027

E201/E191 82248

Apparatus for Measuring Weak Remanent Magnetization of Rocks

out with a microammeter of M412 type, or is recorded automatically with a potentiometer EPP-09 and a cathode-ray oscillograph. The sensitivity threshold of the instrument is $I_{min} = 5 \times 10^{-8}$ gauss; at this threshold the signal and noise levels are equal. The external form of the instrument is shown in Fig 3, and some of the results are given in Fig 4 for a sample with $I_{total} = 1.9 \times 10^{-5}$ gauss (curve 6); other curves in Fig 4 represent the conditions with an empty holder (curves a and 3) and with no holder or sample (curve 5). The paper ends with a discussion of a pulse form of the instrument (Fig 5) and mentions the idea of S.P. Kapitsa and R.Ya. Berkman who suggested an instrument with a multipole stator and n pairs of coils. Acknowledgements are made to Academician I.V. Obreimov for his advice, to G.N. Petrova for her advice and help in collaboration, to D.D. Breznnev, Yu.P. Zhdanov and V.I. Lantsov for their help in making the instrument. There are 5 figures and 5 references: 3 Soviet, 1 English and 1 translation.

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S/049/60/000/01/018/027

E201/E191 82248

Apparatus for Measuring Weak Remanent Magnetization of Rocks

ASSOCIATION: Akademiya nauk SSSR, Institut elementoorganicheskikh
soyedinekiy
(Institute of Heteroorganic Compounds, Academy of
Sciences USSR)

SUBMITTED: October 3, 1958

Card 3/3

✓

S/032/60/026/010/011/035
B016/B054

AUTHORS: Dianov-Klokov, V. I. and Saltykova, V. A.

TITLE: Spectroscopic Determination of Nitrogen Impurities in Argon

PERIODICAL: Zavodskaya laboratoriya, 1960, Vol. 26, No. 10, pp. 1124-1126

TEXT: If the nitrogen impurity in gaseous argon is not large
($C_{N_2} \ll 0.1 - 0.2\%$), filters can be used instead of a spectrograph to

separate the spectral regions to be compared (Refs. 1, 2). The design and dependability of apparatus with filters must be improved. The apparatus described in Ref. 1 requires a stabilization of the current sources of the photomultipliers and the discharger. Further, the mixture to be analyzed must be freed from oxygen. Also the apparatus described in Ref. 2 is much too complicated. The authors based on the fact that strong light fluxes can be generated in filter photometers, and attempted to build a simple and dependable apparatus without glow cathode, while the previously (Ref. 3) used split-beam method was used again. Fig. 1 shows a diagram of

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Spectroscopic Determination of Nitrogen
Impurities in Argon

S/032/60/026/010/011/035
B016/B054

this analyzer, and Fig. 2 shows the discharger. The voltage of the photo-multipliers is regulated such that the terminal current does not exceed 0.20 - 0.75 ma. An emitter repeater on a П201-A (P201-A) germanium triode amplifies the current by about 50 times its amount. By means of a synchronous switch, this triode is intermittently connected to the frame of the recording logometer ЛЛБ-46 (LPB-46). As the ratio of intensities of the spectral regions compared is dependent on the gas pressure in the discharger (Fig. 3), this pressure (10 mm Hg) is kept constant. Fig. 4 shows calibration curves for two modes of scale adjustment. These diagrams were drawn on the basis of standard mixtures. As the oxygen impurity has only a slight effect on the error of determination of C_{N_2} , it needs not be removed before ($C_{O_2} \ll 0.1\%$). There are 4 figures and 3 Soviet references.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR
(Institute of Elemental-organic Compounds of the Academy of
Sciences USSR)

Card 2/2

KHRAMOV, A.N.; PETROVA, G.N.; KOMAROV, A.G.; KOCHEGURA, V.V.;
Prinimali uchastiye: DIANOV-KLOKOV, V.I.; PIONTKOVSKIY,
S.S.; YANOVSKIY, B.M., nauchnyy red.; RUSAKOVA, L.Ya.,
vedushchiy red.; GENNAD'YEVA, I.M., tekhn.red

[Methodology of paleomagnetic investigations] Metodika paleomag-
nitnykh issledovaniy. Leningrad, Gos. nauchn.-tekhn.izd-vo neft.
i gorno-toplivnoi lit-ry. Leningr. otd-nie, 1961. 130 p.
(Leningrad. Vsesoyuznyi neftianoi nauchno-issledovatel'skii
geologorazvedochnyi institut. Trudy, no.161) (MIRA 14:7)

1. Vsesoyuznyy neftyanoy nauchno-issledovatel'skiy geologorazved-
ochnyy institut (for Khramov). 2. Moskovskiy gosudarstvennyy
universitet (for Petrova). 3. Vsesoyuznyy nauchno-issledovatel'-
skiy geologicheskii institut (for Komarov, Kochegura). 4. In-
stitut elementorganicheskikh soyedineniy (for Dianova-Klokov).
5. Institut fiziki Zemli AN SSSR (for Piontkovskiy). 6. Len-
ingradskiy universitet (for Yanovskiy).

(Magnetism, Terrestrial)

39865

5.5310

S/051/62/013/002/002/014
E032/E514

AUTHOR: Dianov-Klovov, V.I.

TITLE: The form of absorption bands of condensed oxygen
(6300-4773 Å)

PERIODICAL: Optika i spektroskopiya, v.13, no.2, 1962, 200-205

TEXT: The photoelectric "phase" spectrometer described in a previous paper (Ref.9: PTE, No.2, 45, 1959) was used to study the dependence of the form of the absorption bands 6290, 5769 and 4773 Å on temperature ($T = 78-300^{\circ}\text{K}$, $\rho = 0.31, 0.76$ and 1.2 g/cm^3 ; pressures up to 250, 950 and 3500 atm, respectively) and density ($T = 78^{\circ}\text{K}$, $\rho = 1.2$ to 1.9 g/cm^3 ; pressures up to 7000 atm). The results obtained are shown in Figs. 2, 5 and 6. The observed line profiles can be satisfactorily described by a formula with a single arbitrary constant. There are 7 figures.

SUBMITTED: June 14, 1961.

Fig.2. Legend. Dependence of absorption at the band maxima on density at $T = 78^{\circ}\text{K}$ (arrows indicate transitions, triangles represent previous data).

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The form of absorption bands ...

S/051/62/013/002/002/014
E032/E514

Fig.5.Legend. Variation in the half-width of bands with density.

Fig.6.Legend. Variation of the half-width of bands with temperature.

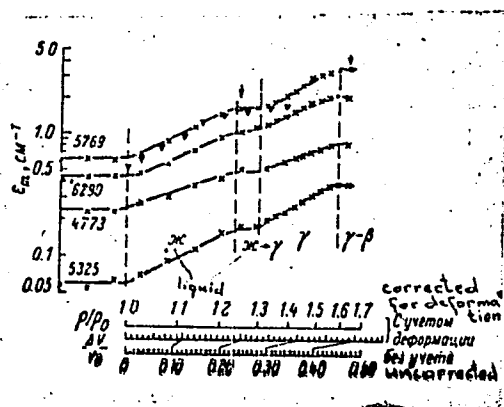


Fig.2

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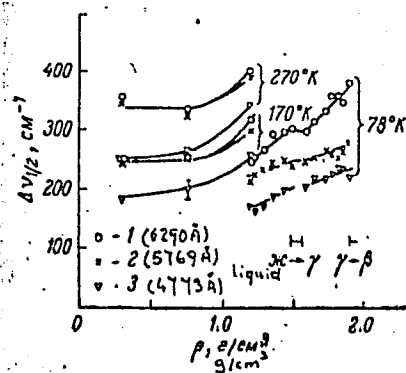
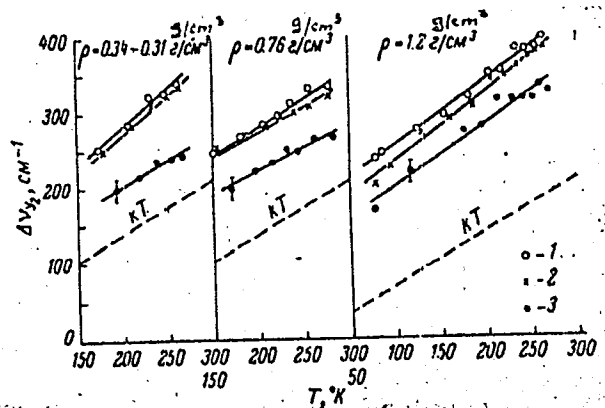


Fig.5

The form of absorption bands ...

S/051/62/013/002/002/014
E032/E514



1 - 6290 Å
2 - 5769 Å
3 - 4773 Å

Fig. 6

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BURAKOV, K.S.; ~~DIANOV-KLOKOV, V.I.~~

Sensitive γ -meter. Izv. AN SSSR. Ser. geofiz. no.2:210-212 F
'62. (MIRA 15:2)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova
i Institut elementoorganicheskikh soyedineniy AN SSSR.
(Magnetic measurements)

DIANOV-KLOKOV, V.I.; PALITSYNA, I.A.; STAKHOVSKIN, A.P.

Narrow-band recording device for the frequency range 5 — 5,000
cps. Prib. i tekhn. eksp. 8 no.6:89-92 M-D '63.

(MIRA 17:6)

1. Institut fiziki atmosfery AN SSSR.

1 06/01/65 ENG(j)/EWT(m)/EPF(c)/EPR/ENP(t)/ENP(b) Px-4/Ps-4 IJP(c) JD

ACCESSION NR: AR5012240

UR/0058/65/000/003/DC24/DC24

SOURCE: Ref. zh. Fizika, Abs. 3D167

37
B

AUTHOR: Dianov-Klokov, V. I.

TITLE: Absorption spectrum of oxygen at pressures 2--35 atm in the 12,600-3600 Å region

CITED SOURCE: Tr. Kom. po spektroskopii AN SSSR, vyp. 1, 1964, 568-584

TOPIC TAGS: absorption spectrum, oxygen, pressure dependence, oxygen complex band, atmospheric band, optical diameter, oscillator strength

TRANSLATION: The absorption spectrum of compressed oxygen at pressures 2-35 atm ($T = 290$ K) was investigated in the 12,600--3600 Å region. It is shown that the absorption of oxygen in the 12,600-3030 Å region comprises two coexisting spectra: bands of "atmospheric" systems and bands connected with the complex $[O_2]_2$. The latter dominate starting with pressures $p = 1$ --2 atm over the entire region, with the exception of the 7620--6889 Å section, in which the atmospheric system

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ACCESSION NR: AR5012240

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$x^3\Sigma^- \rightarrow A^1\Sigma^+$ makes a noticeable contribution up to $p = 3000\text{--}5000$ atm. The oscillator strengths of both "atmospheric" systems: $x^2\Sigma^- \rightarrow A^1\Sigma^+$ and $x^3\Sigma^- \rightarrow a^1\Delta$ ($f = 2.5 \times 10^{-10}$ and 0.1×10^{-10} respectively) are determined, as well as the optical diameter of the molecules, starting from the structure of the 7620 \AA band ($d_{\text{opt}} = 4.0 \pm 0.3 \text{ \AA}$). The lifetime of the complex $[O_2]_2$ in the ground state is estimated at $\tau > 0.3 \times 10^{-13}$ sec.

SUB CODE: IC, CP

ENCL: 00

Card 2/2

ACCESSION NR: AP4020953

S/0051/64/016/003/0409/0416

AUTHOR: Dianov-Klokov, V. I.

TITLE: Absorption spectrum of oxygen in the 12 600 to 3600 Angstrom region at pressures from 2 to 35 atmospheres

SOURCE: Optika i spektroskopiya, v.16, no.3, 1964, 409-416

TOPIC TAGS: oxygen absorption, oxygen absorption spectrum, condensed oxygen, atmospheric oxygen, oxygen molecule association, oxygen complex

ABSTRACT: Earlier investigations by the author and others have shown that the absorption spectrum of condensed (solid, liquid and highly compressed) oxygen is associated mainly with the molecular complex $(O_2)_2$. The bands of condensed oxygen and oxygen in liquid mixtures with N_2 , A and Kr have been classified by the author (Opt. i spektr. 6, 457, 1959) and others into groups according to wavelengths and attributions to one of the complex components ("atmospheric" system) or to the $(O_2)_2$ complex as a whole. This complex is the only probable association of O_2 molecules at moderate pressures. The present work was undertaken to obtain further information of the behavior of the oxygen spectrum. The absorption was measured in the region

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ACCESSION NR: AP4020953

from 12 600 to 3600 Å at oxygen pressures from 2 to 35 atm ($T = 290^\circ\text{K}$). There was used a special four-path absorption cell with internal aluminized mirrors (total path length 10 meters). The spectrograms were recorded by means of a KSA-1 glass prism spectrograph and a GAISH solar spectrograph with a dispersion of 1.6 Å/mm in the first order (600 lines/mm grating). The main source was an STs-48 incandescent lamp. Some spectra and the pressure dependences of some of the bands are presented in figures. Generally, the intensity is proportional to P^2 . It is shown that the absorption of compressed oxygen is composed of two spectra: "atmospheric" system bands and bands associated with the $(\text{O}_2)_2$ complex. The latter dominate at pressures above 1-2 atm except in the 7620-6889 Å interval, wherein the "atmospheric"

$X^3\Sigma_g^- \rightarrow A^1\Sigma_g^+$ makes a significant contribution. The oscillator strengths of the two "atmospheric" systems $X^3\Sigma_g^- \rightarrow A^1\Sigma_g^+$ and $X^3\Sigma_g^- \rightarrow a^1\Delta_g$ were found to be $f = 2.7 \times 10^{-10}$ and $f = 0.1 \times 10^{-10}$, respectively. The optical cross section of the O_2 molecule deduced from the structure of the 7620 Å band is $4.0 \pm 0.3 \text{ Å}$. Evaluations yield a value of $0.3 \times 10^{-13} \text{ sec}$ for the lifetime of the $(\text{O}_2)_2$ complex in the ground state. "The author is grateful to G.V. Rosenberg for his interest in the work and G.D. Turkin for assistance in the measurements." Orig.art.has: 4 formulas, 7 figures and 1 table.

Card 2/3

ACCESSION NR: AP4042996

S/0051/64/017/001/0146/0149

AUTHOR: Dianov-Klovov, V. I.

TITLE: On the bands of the complex [0 sub 2] sub 2 in the near infrared absorption spectrum of the atmosphere

SOURCE: Optika i spektroskopiya, v. 17, no. 1, 1964, 146-149

TOPIC TAGS: spectrometry, atmospheric ir absorption, oxygen effect, ir absorption spectrum, solar ir, solar spectrography

ABSTRACT: To check on earlier extrapolations by the author (Opt. i spektr. v. 16, 409, 1964), which indicated the presence of strong absorption of atmospheric oxygen in the near infrared, the authors attempted to observe the 10,600 Å band in the absorption spectrum of the atmosphere and to measure its intensity. The intensity measurement is of particular interest since no quantitative experimental data have been published as yet on the intensity of the [O₂]₂ bands

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ACCESSION NR: AP4042996

in the spectrum of the atmosphere. The GAISH solar spectrometer ($f = 10$ m, relative aperture 1:50, dispersion 1.6 \AA/mm in the first order using a grating with 600 lines/mm) and single-beam photometry were used. An asymmetrical diffuse line of half-width $\sim 180 \text{ \AA}$ with peak at $10,640 \pm 20 \text{ \AA}$ was observed, with an optical density that agreed well with theory and with the data extrapolated from those obtained for compressed oxygen, under the assumption that the $10,640 \text{ \AA}$ band does not have an unresolved line structure. This shows that the spectral bands of the $[\text{O}_2]_2$ spectrum remain diffuse down to low oxygen pressure. "I thank G. V. Rozenberg for interest in the work and G. D. Turkin for help with the measurements." Orig. art. has: 2 figures, 1 formula, and 1 table.

ASSOCIATION: None

SUBMITTED: 03Oct63

ENCL: 00

SUB CODE: OP

NR REF SOV: 003

OTHER: 004

Card 2/2

L 3581-66 EWT(1)/EPF(c) IJP(a) WW/GG
ACCESSION NR: AP5021875

UR/0362/65/001/008/0880/0883
535.242.2:551.591

AUTHORS: Georgiyevskiy, Yu. S.; Dianov-Klovov, V. I.; Turkin, G. D.

TITLE: A logarithmic photometer with compensation of the disturbances from the turbulent fluctuations of the light beam

SOURCE: AN SSSR. Izvestiya. Fizika atmosfery i okeana, v. 1, no. 8, 1965, 880-883

TOPIC TAGS: photometry, transmission spectrum, turbulence effect, automatic regulation / DMR 4 monochromator, logarithmic diode

ABSTRACT: A reliable and simple logarithmic photometer is so designed that it automatically compensates for turbulent fluctuations arising as a light beam travels along the measurement path. The atmospheric transmission spectrum is measured by U_{D1} , the logarithmic ratio of the intensity of the light beam traveling the measurement path (I') to the light beam which serves to compensate for internal variations of the instrument (I''). The external turbulent fluctuation is compensated for by adding a thin quartz wafer (KP_2 in Fig. 1 on the Enclosure) which directs a part of the beam along the "fluctuation path." The logarithmic diode (D_2) which serves as a load for the photometer is identical to the

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L 3581-66

ACCESSION NR: AP5021875

9

logarithmic diode (D_1) in the signal path. Both diodes produce pulse voltages, the difference between which is obtained from the difference unit (V). Tests at $\lambda = 7620 \text{ \AA}$ using a DMR = 4 double prism monochromator having a resolution of 30 \AA indicated that the noise was reduced by a factor of 8. The authors thank G. V. Rozenberg for his suggestions as to the theory of the operation of the compensating unit, and S. V. Ovchinnikova for her assistance in testing. Orig. art. has: 3 figures and 4 formulas. 44,55

ASSOCIATION: Akademiya nauk SSSR, Institut fiziki atmosfery (Atmospheric Physics Institute, Academy of Sciences SSSR)

SUBMITTED: 03Mar65

ENCL: 01

SUB CODE: EC, ES

NO REF SOV: 004

OTHER: 000

Card 2/3

L 3581-56

ACCESSION NR: AP5021875

ENCLOSURE: 01

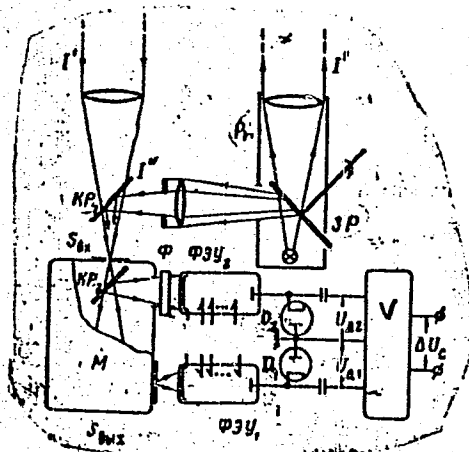


Fig. 1.

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L 61682-65

ACCESSION NR: AP5011111

UR/0051/65/018/004/0579/0586
535.34 : 546.2

AUTHOR: Dianov-Klovov, V. I.; Malkov, I. P.; Rozenberg, G. V.

TITLE: On the absorption spectrum of oxygen in clatrate

SOURCE: Optika i spektroskopiya, v. 18, no. 4, 1965, 579-586

TOPIC TAGS: clatrate, absorption spectrum, oxygen molecule rotation, magnetic susceptibility

ABSTRACT: The absorption spectra of powders of oxygen-containing and nitrogen-containing clatrates were obtained. The clatrate was obtained by the method of D. F. Evans and R. E. Richards (J. Chem. Soc. no. 8, 3295, 1952). Powder was used because the absorption of the oxygen was too weak to permit the use of individual clatrate crystals. The equipment and procedure are described. The results show that the absorption band of the $7650 \text{ \AA } 3\pi_g^- \rightarrow 1\pi_g^+$ transition of the O_2 molecules included in the clatrate voids is shifted by 50 cm^{-1} towards lower frequencies, compared with the "atmospheric" band. Its shape practically coincides with the envelopes of the rotational branches of the "atmospheric" band, thus indicating that

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L 61682-65

ACCESSION NR: AP50111112

the O₂ molecules rotate freely in the voids, in accord with the known data on the temperature dependence of the magnetic susceptibility of oxygen in clatrate. The smearing of the rotational level exceeds 5--8 cm⁻¹. "We thank N. M. Barbarisov for help with the preparation of the clatrate and G. D. Turkin for help with the measurements." Orig. art. has: 6 figures, 1 formula, and 1 table.

ASSOCIATION: None

SUBMITTED: 05 Apr 64

ENCL: 00

SUB CODE: OP

NR REF SOV: 005

OTHER: 006

llc
Card 2/2

L 3978-66

ACCESSION NR: AP5022357

UR/0115/65/000/007/0035/0039
621.314.22.001.24

AUTHOR: Dianov-Klokov, V. I.; Stakhovskiy, A. D.; Palitsyna, I. A. 14
B

TITLE: Designing the input transformer of an amplifier for a thermocouple and bolometer (operating frequency, dimensions, inherent noise)

SOURCE: Izmeritel'naya tekhnika, no. 7, 1965, 35-39

TOPIC TAGS: circuit design, electric transformer, amplifier design, bolometer

ABSTRACT: The authors derive formulas for calculating the equivalent resistivities of losses in the core and wire, inductance per turn and number of turns in the secondary as functions of frequency and core parameters in the input transformer of an amplifier for a thermocouple and bolometer. These formulas are then used for finding the maximum amplification of the transformer as a function of frequency and dimensions. A formula is given for the passband at optimum tuning. The design formulas were tested by making three transformers with cores of various sizes made of various types of permalloy. The results are tabulated. The curves based on experimental data are compared with theoretical curves. There is a noticeable deviation

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ACCESSION NR: AP5022357

from the theoretical curves only at higher frequencies due to the fact that the design curves do not account for losses from eddy currents nor for self-capacitance. Formulas are also given for determining inherent noise in the transformer. These formulas were experimentally verified on the noisiest transformers and found to agree satisfactorily with empirical data. Orig. art. has: 5 figures, 19 formulas, 1 table.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: EC

NO REF SOV: 003

OTHER: 001

GC

Card 2/2

L 26068-66 EWT(1)/FCC GN

ACC NR: AP6003449

SOURCE CODE: UR/0362/66/002/001/0094/0095

154
72
B

AUTHOR: Georgiyevskiy, Yu. S.; Gorchakov, G. I.; Dianov-Klokov, V. I.; Romanova, L.M.

ORG: none

TITLE: Conference on the spectral ¹²transparency of the atmosphere in the visible and infrared regions of the spectrum

SOURCE: AN SSSR. Izvestiya. Fizika atmosfery i okeana, v. 2, no. 1, 1966, 94-95

TOPIC TAGS: atmosphere transparency, light scattering, meteorologic conference, light absorption, IR radiation, atmospheric turbulence, fog, atmospheric humidity, IR spectroscopy, troposphere, electromagnetic field, quantum mechanics, atmospheric cloud, optic property

ABSTRACT: A scientific conference of the Institutes of Higher Education was held in Tomsk from 29 June to 1 July 1965 on problems dealing with the spectral transparency of the atmosphere in the visible and infrared regions. The conference was convened in accordance with a directive of the Ministry of Higher and Intermediate Specialized Education of the RSFSR, and was organized by the Commission on Radiation of the Academy of Sciences USSR and the Siberian Physicotechnical Institute imeni V. D. Kuznetsov of Tomsk State University. Representatives of 14 different organizations presented some 70 papers on both theoretical and experimental investigations of the spectral transparency of the atmosphere, light propagation

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UDC: 551.521

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L 26068-66

ACC NR: AP6003449

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in a scattering medium, turbulent fluctuations, measuring equipment, and the techniques of measurement.

Following the introductory remarks of the chairman of the organizing committee, K. Ya. Kondrat'yev (Leningrad State University), the following survey reports were read: Chief results of ground- and upper-level spectral investigations of the infrared transparency of the atmosphere up to 13μ ; solution of direct and inverse problems by K. Ya. Kondrat'yev, I. Ya. Badinov, S. D. Andreyev, and D. V. Andreyev (Leningrad State University), and Current state of the art of experimental and theoretical work on the absorption of infrared radiation in the atmosphere by V. V. Zuyev (Siberian Physicochemical Institute).

A good many of the reports dealt with the molecular absorption of light.

A series of reports by B. S. Neporent, M. S. Kiseleva, Ye. O. Fedorova, M. M. Miroshnikov, and B. N. Batenov examined certain patterns of absorption of IR radiation along different trajectories in the atmosphere in the region of forbidden bands in the case of a continuous spectrum source as well as the results of utilizing these patterns to investigate the vertical profiles of humidity. Related to these investigations was the work of I. Ya. Badinov, S. D. Andreyev, and B. V. Lipatov (Leningrad State University) on the dynamics of the moisture content of layers of the

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ACC NR: AP6003449

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atmosphere as derived from spectroscopic observations. Reports by K. Ya. Kondrat'yev, I. Ya. Badinov, S. D. Andreyev, D. V. Andreyev, V. B. Lipatov, Ye. M. Yesipova, G. A. Nikol'skiy, T. A. Kakar'yeva, N. Ye. Ter-Markaryants, and V. F. Zhvaley (Leningrad State University) suggested the use of spectral investigations of IR radiation at different heights to solve some meteorological problems.

A large number of reports dealt with theoretical and experimental investigations of the functions of atmospheric transmittance in the infrared bands of H₂O and CO₂ absorption (V. Ye. Zuyev, S. D. Tvorogov, L. I. Nesmelov, I. I. Ippolitov, Yu. S. Makushin, A. A. Orlov of the Siberian Physicotechnical Institute; B. M. Golubitskiy, S. O. Mirumyants, S. K. Moskalenko, and A. M. Brounshteyn) and the computation of the intensities in the H₂O and CO₂ absorption bands (Yu. S. Makushin, E. V. Luchin of the Siberian Institute and B. M. Golubitskiy.) Yu. S. Georgiyevskiy (Institute of Physics of the Atmosphere) reported on the results of photoelectric measurements of the transparency of the ground layer of the atmosphere in the 0.37—1.14 μ sector with a resolution of 1—2 Å, which the author compares with computations made on the basis of data from the simultaneous determination of the microstructure by direct methods.

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The characteristics of atmospheric absorption of linear radiation of heated gases (H_2O vapors) in the near-infrared region of the spectrum were examined in a report by E. S. Kuznetsova and M. V. Podkladenko.

The latter also delivered a paper on the limits of applicability of schematic models of absorption bands in describing experimental results.

Investigations of the absorption by a horizontal atmospheric layer of the radiation of a slightly heated absolutely black radiator were reported by B. P. Kozyrev and A. P. Buznikov (Leningrad Electrical Engineering Institute imeni V. I. Ul'yanov). Ye. P. Barashkov delivered a paper on the change of the spectral composition of long-wave ascending fluxes in the lower layers of the troposphere under the influence of absorption.

A theoretical investigation of the influence on the absorption-line profile of strong absorption and a strong electromagnetic field was made by L. I. Nesmelova, S. D. Tvorogov, N. I. Ippolitov, and A. A. Orlov (Siberian Physicotechnical Institute).

Other reports read were: K. P. Vasilevskiy, V. A. Kazbanov, and T. Ye. Derviz, on the results of experimental investigations of the spectrum of CO_2 absorption in the $2.06\text{-}\mu$ region and the patterns of distribution of optical cross sections for individual lines of a band; V. I. Dianov-Klokov

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ACC NR: AP6003449

(Institute of Physics of the Atmosphere), on the expected influence of $[O_2]_2$ and $[O_2 - N_2]$ complexes on the transparency of the atmospheric ground layer in the $0.28-0.235-\mu$ region; V. A. Afanas'yev, A. V. Nevskiy, M. A. Katintsev, and V. G. Naberezhnyy, on the design of an

installation, based on the principle of heterodyning, to measure the atmospheric attenuation of a laser beam; Yu. S. Georgiyevskiy, V. I. Dianov-Klovov, S. V. Ovchinnikov, and G. D. Turkin (Institute of Physics of the Atmosphere), on the design of instruments to measure the spectral transparency of the atmosphere with automatic compensation for interference caused by atmospheric turbulence.

Many reports were on the problem of light scattering in the atmosphere and the theory of multiple light scattering, including, for example, L. M. Romanov (Institute of Physics of the Atmosphere), on radiation transfer

in forbidden bands of absorption; O. I. Smoktiy (Leningrad State University), on computing the sphericity of the atmosphere; G. M. Krekov (Siberian Institute), on computing the intensity of light at small angles in the case of large scattering particles; L. M. Romanov, L. I. Koprov, and M. S. Malkevich (Institute of Physics of the Atmosphere), on the influence of

scattering in the atmosphere on spectral transparency; L. G. Borovoy (Tomsk State University), on computing a mean field in a scattering medium on the basis of Maxwell equations. N. P. Kalashnikov and M. I.

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ACC NR: AP6003449

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Ryazanov (Moscow Engineering Physics Institute) reported on the use of the quantum mechanical approach to investigate the passage of a narrow beam of light through a scattering medium. A. P. Ivanov (Institute of Physics of the Belorussian Academy of Sciences) reported on the results of an experimental study of a light field in models of strong scattering media. The results of investigating the optical properties of clouds on model media were contained in a report by G. K. Il'ich (Institute of Physics of the Belorussian Academy of Sciences), K. S. Shifrin, A. Ya. Perel'man, and V. G. Bakhtiarov (Main Geophysical Observatory imeni A. I. Voyeykov) described a method of computing the spectra of scattering particles from data on the spectral transparency of the atmosphere and indicated certain criteria for selecting spectral intervals. Yu. S. Lyubovtseva (Institute of Physics of the Atmosphere) reported on measurements of light scattering at small angles and on the influence of such scattering on the results of measuring the spectral transparency of the atmosphere. In M. V. Kabanov's (Siberian Institute) work, interference in the case of light scattering at small angles, was investigated. The report of T. P. Toropova (Astrophysical Institute of the Kazakh Academy of Sciences) described a study of the scattering properties of the atmosphere in different spectral regions. G. Sh. Lifshits, V. Ye. Pavlov, and S. N. Milyutin (Astrophysical Institute of the Kazakh Academy of Sciences) used the Ulbricht

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light-measuring sphere to investigate pure-light absorption in aerosols. V. K. Sonchik, V. P. Lopasov, and N. A. Chernyavskaya (Siberian Institute) presented a report on the results of measurements of complex indices of water in the 2 to 20- μ region. 9

Several reports were presented on investigations of artificial fogs. For example, B. P. Kozyrev and A. V. Mezenov (Leningrad Electrical Engineering Institute) reported on their studies of the attenuation of long-wave radiation in artificial fogs for regions of the spectrum from 0.5 to 200 μ . The report of B. P. Kosheleva (Tomsk State University) compared experimental and computational data on the coefficient of radiation attenuation in artificial fogs in the 0.42--14- μ region. In these experiments a detailed measurement of the parameters of the microstructure of the fog was made simultaneously. The results of experimental and theoretical investigations of strong fluctuations in light propagation in a turbulent atmosphere were reported by V. L. Tatarskiy, A. S. Gurvich, M. Ye. Gracheva (Institute of Physics of the Atmosphere). And, lastly, N. P. Nalimov reported on the effects of atmospheric turbulence on laser communications. [FSB: v.2, no. 3]

SUB CODE: 04, 20 / SUBM DATE: none

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L 42906-66 EWT(m)/EWP(j)/EWP(t)/ETI IJP(c) JD/WN/JW/RM

ACC NR: AP6018437

SOURCE CODE: UR/0051/66/020/006/0954/0962

AUTHOR: V. I. Dianov-Klovov

ORG: none

TITLE: Absorption spectrum of condensed oxygen in the 1.26-0.3 μ range

SOURCE: Optika i spektroskopiya, v. 20, no. 6, 1966, 954-962

TOPIC TAGS: LOX, absorption spectrum, intermolecular force

ABSTRACT: The theory of the origin of the intermolecular interaction component in the absorption spectrum of condensed oxygen in the 1.26-0.3 μ range is analyzed. A simplified model of spectrum intensities is considered in atmospheric oxygen, compressed oxygen, the critical range, LOX, and compressed γ - and α -oxygen. It appears that light absorption by condensed oxygen is fully determined by the spectral component that is related to the intermolecular interaction, beginning from $p \approx 5$ amagats in the entire range of 1.26-0.3 μ . An exception is the 0.76-0.69 μ range; here the red atmospheric system $O, {}^3\Sigma^- \rightarrow {}^1\Sigma^+$ dominates in intensity up to $p \approx 150$ amagats. The mechanism of the formation of this spectral component does not undergo any radical changes throughout the entire range of densities and states. Thus, it could be considered a valid generalized model. The original transfer model suggested by Ellis and Kneser should be supplemented by a consideration of the possibility of single transfers in the $[O]_h$

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pair. The $[O_2]$ complex is not a stable dimer but a short-lived formation, somewhat resembling an impacting pair with a friable electron configuration. Its lifetime in gas is $3 \cdot 10^{-13} \leq \tau \leq 2 \cdot 10^{-11}$ sec. Hence, an unrestricted application of Lewis' equations is not entirely justified; they may be considered as interpolation formulas and used in certain specific cases only. Orig. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: 20Nov64/ ORIG REF: 016/ OTH REF: 016

Card 2/2

ACC NR: AR0055435

SOURCE CODE: UR/0051/66/021/004/0413/0419

AUTHOR: Dianov-Klokov, V. I.

ORG: none

TITLE: Absorption by gaseous oxygen and its mixtures with nitrogen in the 2800 - 2350 Å region

SOURCE: Optika i spektroskopiya, v. 21, no. 4, 1966, 413-419

TOPIC TAGS: gas absorption, oxygen, nitrogen, pressure effect, oscillator strength, photometric analysis

ABSTRACT: The investigations were made at pressures 1 - 20 kg/cm² and temperature 293K for the purpose of obtaining quantitative photometric data and comparing the behavior of the spectrum in the 2800 - 2350 and 13,000 - 6800 Å regions. Commercial nitrogen and oxygen gas were used without additional purification. The equipment and apparatus were similar to those described in earlier investigations (Opt. i spektr. v. 16, 409, 1964; PTE no. 6, 89, 1963). The results yielded the oscillator strength of the most intense Hertzberg system of O₂(³Σ_g⁻ + ³Σ_g⁺, f ≈ 1 × 10⁻⁹), which was found to be much smaller than for the "triplet" series corresponding to the transition ³Σ_g⁻ + ³Δ_u and the complexes [O₂]₂ and [O₂ - N₂] (f ≈ 1 - 10⁻⁶ per colliding pair). It is shown that, just as in the 13,000 - 8,000 Å band, the absorption of light by condensed oxygen in the 3000 - 2300 Å band for ρ ≥ 3 - 5 Amagat units is practically completely connected with the complexes, and the single O₂ molecules play a minor role. Extra-

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UDC: 535.34: 546.21 - 31